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PRESIDENT'S MESSAGE

I do not want to repeat elements from the 2014-2015 annual report in this message but since what became a two-year term as CMSA's president is coming to an end, I would like to acknowledge once again the involvement of members of the Executive without whom it would not have been possible to fulfill my duties. I would like to thank them for their contributions to the Association, not that the functions associated with being President were particularly overwhelming, but because the dynamics of a team such as the one of the CMSA Executive made overall achievements relatively easy and enjoyable in spite of each individual's busy workload. You will learn more about the work and achievements made by various committees in this issue.

I recall, as an Animal Science student and when considerations given by the industry to the final product hardly went beyond carcass and primal cut yields, a lecture on the effect of stress not only at the organism level but also of its post-mortem consequences which led me to discover the meat sciences, opening possibilities for meat quality improvement. What a thrill this was even though I realized that this relatively young science was still little known and therefore little sought. Fortunately, the CMSA was going to be founded shortly thereafter by pioneers such as Les Jeremiah, André Fortin and Steve Morgan Jones, just to name a few. They each succeeded one another as Presidents of the Association when it was created. I know, having had known them, that this same need to promote or acknowledge this science had prompted them to create the CMSA.

The Association has since grown and will continue to do so. In addition to tremendous annual achievements by different committees, networking with other national or international associations is also taking place. Obtaining CMSA's acknowledgement and participation in working groups to identify research priorities with the industry is also a project to follow, which in my opinion, justifies on its own the purpose of the Association. CMSA will always have new challenges to address and the

involvement, passion and devotion of its members will lead to success.

I would like to finish my message, by acknowledging the contribution of a great scientist that left us recently. I was a new researcher when I met Colin Gill and, among some anecdotes that I remember, the following describes his great character, his respect but also his incredible sense of humour. During an ICoMST conference one year (I forget which one), I had to answer a tricky question during a plenary session that I must admit bothered me. Colin, who sat behind me, put his hand on my shoulder and while refraining from laughing said: "You should have told him that his question was totally irrelevant!"

Thank you Colin, you not only helped the industry.

Claude Gariépy

P.S. I look forward to seeing you all in Ottawa in May!

MESSAGE DU PRÉSIDENT

Je ne voudrais pas dans ce message répéter les éléments du rapport annuel de 2014-2015, mais parce que je termine ce mandat qui s'est en fait étendu sur deux années, je désire reconnaître à nouveau l'implication des membres de l'exécutif sans laquelle il ne m'aurait pas été possible de m'acquitter de mes fonctions. Je désire les remercier pour leur apport à l'Association, non pas que les tâches associées à la fonction de Président aient été particulièrement accablantes, mais parce que la dynamique d'une équipe comme celle de l'exécutif de l'ASCV, a rendu, malgré une charge de travail personnelle déjà bien suffisante pour chacun, j'en suis sûr, les accomplissements d'ensemble de l'ASCV relativement faciles et agréables. Vous prendrez connaissance de l'ensemble du travail et des réalisations des différents comités dans ce numéro.

Je me souviens qu'à l'époque où j'étais étudiant en science animale et que les considérations que l'industrie accordait au produit final ne dépassaient guère le rendement de la carcasse et

celui de ses coupes primaires, une lecture particulière portant sur les effets du stress non seulement au niveau de l'organisme mais aussi de ses conséquences post-mortem m'avait fait découvrir la science de la viande et des moyens qu'elle offrait pour améliorer la qualité du produit. Quelle énergie ce fut même si je constatais du même souffle que cette nouvelle science était encore relativement peu connue et donc peu sollicitée. Heureusement, l'ASCV allait bientôt être fondée par des pionniers tels Les Jeremiah, André Fortin et Steve Morgan Jones, pour n'en nommer que quelques-uns qui se sont succédé tour à tour comme président de l'Association à ses débuts. Je sais, pour avoir eu la chance de les connaître, que ce même besoin de faire connaître ou reconnaître cette science les aura animés dans la création de l'ASCV.

L'Association s'est développée depuis et va continuer à le faire. Outre les excellentes réalisations annuelles des différents comités, le maillage possible avec d'autres associations nationales ou internationales est en développement. Obtenir la reconnaissance et la participation de l'ASCV aux groupes de travail pour l'identification des priorités de recherche avec l'industrie est aussi un projet à poursuivre qui, selon moi, peut justifier en soi, la raison d'être de l'Association. L'ASCV aura par ailleurs toujours de nouveaux défis à relever et la participation, la passion et le dévouement de ses membres sera toujours son gage de succès.

J'aimerais pour terminer, souligner à ma façon la contribution d'un grand scientifique qui nous a quitté récemment. J'étais nouveau chercheur quand j'ai rencontré Colin Gill et, parmi quelques anecdotes que je pourrais rappeler, celle-ci, décrit en une image la grandeur du personnage, son respect mais aussi son incroyable sens de l'humour. Lors d'une conférence de l'ICoMST dont j'ai oublié l'année, j'avais eu à fournir lors d'une plénière une réponse à une question piège qui, je dois l'avouer, m'avait embêtée. Colin, assis derrière moi, avait alors mis sa main sur mon épaule et m'avait dit en étouffant son rire, « tu aurais dû lui dire que sa question était totalement impertinente! ».

Merci Colin, tu n'as pas seulement aidé l'industrie.

Claude Gariépy

P.S. Au plaisir de vous voir en grand nombre à Ottawa en Mai prochain!

IN MEMORIAM DR. COLIN OGILVIE GILL (1943-2014)



Dr. Gill was born in Forfar, Scotland in 1943. He obtained his Ph. D. in Biochemistry from the University of Hull, UK in 1973. He then emigrated with his wife and children to New Zealand to start his scientific career as a meat microbiologist at the Meat Research Institute of New Zealand. He served at the Meat Research Institute of New Zealand for 16 years. In 1989, he was attracted as a research scientist in Meat Hygiene by Agriculture and Agri-Food Canada at the Lacombe Research Station. Dr. Gill was one of the pioneers in evaluating modified atmosphere packaging to increase the shelf life of fresh pork destined for international markets. He played an enormous role on the implementation of hazard analysis critical control point (HACCP) systems at meat packing plants. His work on the safety of mechanically tenderized and moisture enhanced meats has been valuable for the meat industry and regulatory authorities in Canada and the US. He published over 250 scientific publications and held 4 patents. He also served as a member of the European Union

Risk Analysis Network. Dr. Gill was awarded the Commemorative Medal for the 125th anniversary of Canadian Federation (1994) for his significant contribution to Canada as a research scientist, the Agxcellence Award (1996) for the invention and patenting of the carcass pasteurizer and the Canadian Meat Council Science and Technology award (1999). He will be remembered for his candour, his kindness, brilliancy and compassion. Dr. Colin O. Gill, an internationally recognized scientist in meat microbiology, died on December 13, 2014 at his home in Lacombe, Alberta, Canada following a sudden diagnosis of cancer. Dr. Gill is survived by his wife Carol; his sons Alexander, Edmund and Benjamin; his grandchildren Kate, Beatrice and Matthew.

CMSA ANNUAL GENERAL MEETING

Inviting all Canadian Meat Science Association (CMSA) & Canadian Meat Council (CMC) members to attend the Annual General Meeting of the



Thursday, May 7, 2015

4:45 to 5:45 PM

The Westin Ottawa Hotel, BC-Manitoba Room,
2nd Floor
Ottawa, ON

****** All attending will receive a complimentary beverage ticket for the CMC Reception & Banquet following this meeting ******

If you can't attend in person, please plan to attend by Teleconferencing

Agenda Package can be viewed at www.cmsa-ascv.ca
(User name = **cmsa** Password = **myoglobin**)

Information about the CMC 2015 Conference is available at www.cmc-cvc.com

PLEASE RSVP BY April 17TH
TO: admin@cmsa-ascv.ca

ALEX AND TYLER MIFFLIN, THE WATER BROTHERS, PRESENTING: WATER, ITS SUSTAINABLE USE AND PRESERVATION AT THE CMC/CMSA MEETING IN OTTAWA

Alex and Tyler Mifflin are passionate about the subject of water conservation and have created an award-winning TVO series The Water Brothers. They have a powerful desire to communicate their passion that is educational, insightful and useful to meat producers and manufacturers as they explore the problems and solutions to help us better protect our most precious resource.



CPC'S MARY ANN BINNIE PRESENTING A FRESH LOOK AT THE ROLE OF RED MEAT IN THE DIET AT THE CMC/CMSA MEETING IN OTTAWA

The relationship between red meat consumption and disease outcomes has been the subject of significant scientific debate. This preoccupation has distracted us from addressing more significant nutrition issues. It's time to take a fresh look at red meat's role in a healthy diet.



ICOMST 2015

France is hosting the 61st International Congress of Meat Science and Technology (ICoMST) in August 2015. The Congress will take place from August 23rd to the 28th, 2015 in Clermont-Ferrand, France. Please visit the ICoMST 2015 website for more information: <https://colloque.inra.fr/icomst2015>.

NEW CANADIAN BEEF CENTRE OF EXCELLENCE PROVIDES A HOME FOR CANADIAN BEEF INDUSTRY TO CONNECT, INNOVATE, AND INSPIRE – PRESS RELEASE

Aneesha Birk, CBCE Marketing Communications Advisor



The Canadian Beef Centre of Excellence is an exciting new food development and education facility located in Calgary, Alberta, in the heart of Canadian beef country. This region supports more than 70 percent of the beef cattle finishing and processing in Canada.

Canada is one of the leading producers of high-quality beef in the world and the beef and cattle sector makes a significant contribution to the Canadian economy.

Currently, Canadian beef is exported to the following international markets; Japan, China, Southeast Asia, U.S., Mexico, Latin America, Caribbean, Middle East and European Union. The establishment of the Canadian Beef Centre of Excellence enables Canada Beef to further build Canadian beef brand loyalty with key customers in emerging and international markets.

In July, 2014, Agriculture and Agri-Food Canada Minister Gerry Ritz and Minister of State for Western Economic Diversification Michelle Rempel joined Canada Beef Chair Chuck MacLean and President Rob Meijer to announce CDN \$3,844,800 in government funding for the Centre.

“Our Government is proud to support this cutting-edge facility. This Centre will give our industry a competitive advantage in showcasing Canada’s top-quality meats and will allow our producers to capitalize on new and existing market opportunities,” said Minister Ritz during the announcement.

The key components of the Centre include a 24 seat meeting space that can function as a boardroom or dining room, a 20 seat state of the art demonstration theater with a full consumer kitchen and large commercial cooking line for foodservice presentations, and a refrigerated meat lab with all the latest equipment to allow for cutting and fabrication demonstration, and product development.

The Centre is also equipped with global broadcast capability to allow presentations, demonstrations and client interactions to be provided to clients globally.

“The Centre will further empower our industry to reach consumers and customers both here at home and around the world to build brand loyalty and generate new marketing opportunities,” said Rob Meijer.

The Centre is a catalyst for clients to achieve ongoing success with Canadian beef. Services and programing can be customized to the needs of clients both domestically and internationally and can include; training, beef product research and development, communication and outreach, and business development.

Contact Canada Beef at 403-275-5890 or mcarpenter@canadabeef.ca to explore how the Canadian Beef Centre of Excellence can help your business.

This press release was modified from its original version.

IARC EVALUATION OF RED AND PROCESSED MEAT AS A HUMAN CARCINOGEN

Mary Ann Binnie, Manager of Nutrition and Food Industry Relations, Canadian Pork Council

The World Health Organization's International Agency for Research on Cancer (IARC) will evaluate red meat and processed meat as human carcinogen agents in October 2015. The publication of IARC's evaluation will occur in the IARC Monograph series, which identifies factors that can increase the risk of human cancer. The IARC classifications and scientific decisions are recognized worldwide and are considered authoritative scientific opinions for many government and regulatory bodies and the outcome may affect other international agencies like FAO and Codex.

Last November, IARC announced a Meeting 114 for an IARC Monograph meeting on "Red Meat Consumption and Some Related Compounds" and in mid-January 2015, IARC modified the focus of the meeting to "Red Meat and Processed Meat." Meeting 114 will occur in Lyon, France.

The Monograph Committee's evaluation is done by four subgroups: exposure, cancer in humans, cancer in experimental animals, and mechanistic and other relevant data. The subgroups will meet concurrently during that final working week in October, but once the panel of experts is identified, they will likely begin their review. This evaluation will assign red meat and processed meat one of the following classifications:

Group 1	Carcinogenic to humans
Group 2A	Probably carcinogenic to humans
Group 2B	Possibly carcinogenic to humans
Group 3	Not classifiable as to its carcinogenicity to humans
Group 4	Probably not carcinogenic to humans

IARC's evaluation will be a hazard analysis, so minimal consideration is given to the positive nutritional aspects of meat. An awareness of this aspect may increase the critical questioning regarding the validity of studies that show an association of meat consumption and carcinogenicity, but likely will have little impact.

Definitions

What remains unclear from the information provided is how IARC defines "red meat" and "processed meat". Nonetheless, in 2014 the IARC Advisory Group gave red and processed meats a high priority for evaluation and provided the following explanation:

Red and processed meats are consumed as food worldwide. Several meta-analyses have reported a small but mostly statistically significant elevated risk of colorectal cancer with the consumption of red meat or processed meat. In general, risks remain elevated in subgroup analyses by study design, sex, and studies controlling for specific confounders. Some studies suggested an association between increased risk of cancers of the esophagus, lung and pancreas with consumption of red meat, and increased risk of cancers of the lung, stomach and prostate with consumption of processed meat. There was also a large database evaluating cooking methods of meats and cancer risk where cooking methods may help to explain the increased risk observed for consumption of red or processed meats. Cooking meat at a high temperature forms carcinogenic heterocyclic amines and PAHs; mechanistic studies provide support for the potential carcinogenicity of meats cooked at high temperatures. Providing information on potential factors such as cooking methods that may affect cancer risk may be more useful to the public than an evaluation of only red meat or processed meats. (p. 38)

For a more detailed analysis of the IARC process, visit

http://monographs.iarc.fr/ENG/Preamble/ind_ex.php.

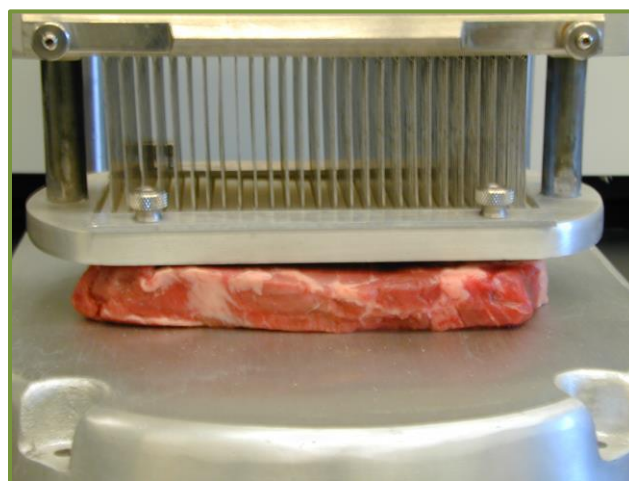
GUIDANCE ON THE APPROPRIATE COOKING FOR MECHANICALLY TENDERIZED BEEF (MTB)

Xianquin Yang and Colin Gill

Agriculture and Agri-Food Canada, 6000 C&E Trail, Lacombe, Alberta, Canada, T4L 1W1

Beef steaks, 2 cm thick were each inoculated at 3 sites in the central plane with *Escherichia coli* O157:H7 at numbers of 5.9 ± 0.3 log CFU/site. Temperatures at steaks centers were monitored during cooking on a hot plate or the grill of a gas barbeque. Steaks were cooked in groups of five using the same procedures during cooking each steak to the same temperature, then the surviving *E. coli* O157:H7 at each site were enumerated. When steaks cooked on the hot plate were turned over every 2 or 4 minutes during cooking to temperatures between 56 and 62°C, no *E. coli* O157:H7 were recovered from steaks cooked to ≥ 58 °C or 62 °C, respectively. When steaks were cooked to ≤ 71 °C and turned over once during cooking, *E. coli* O157:H7 were recovered from steaks in groups turned over after ≤ 8 min, but not from steaks turned over after 10 or 12 min. *E. coli* O157:H7 were recovered in similar numbers from steaks that were not held or held for 3 min after cooking when steaks were turned over once after 4 or 6 min during cooking. When steaks were cooked on the grill with the barbeque lid open and turned over every 2 or 4 min during cooking to 63 or 56 °C, *E. coli* O157:H7 were recovered from only steaks turned over at 4 min intervals and cooked to 56 °C. *E. coli* O157:H7 were recovered from some steaks in groups turned over once during cooking on the grill, and held or not held after cooking to 63 °C. *E. coli* O157:H7 were not recovered from steaks turned over after 4 min during cooking to 60 °C on the grill with the barbeque lid closed or closed after 6 min. Apparently, the microbiological safety of mechanically tenderized steaks can be assured by turning steaks over at intervals of about 2 min during cooking to ≥ 60 °C in an open skillet or on a barbecue grill. If steaks are turned over only once during cooking to ≥ 60 °C, microbiological safety may be assured by covering the skillet or grill with a lid during at least the final minutes of cooking.

CONCLUSIONS: Irrespective of the degree of doneness, MTB steaks may not be microbiologically safe if they are turned over only once during grilling. MTB steaks will be microbiologically safe if they are turned over more than once during cooking to at least a medium rare condition (63 °C).

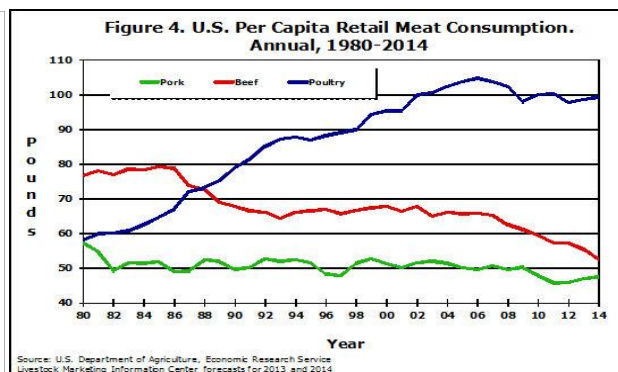
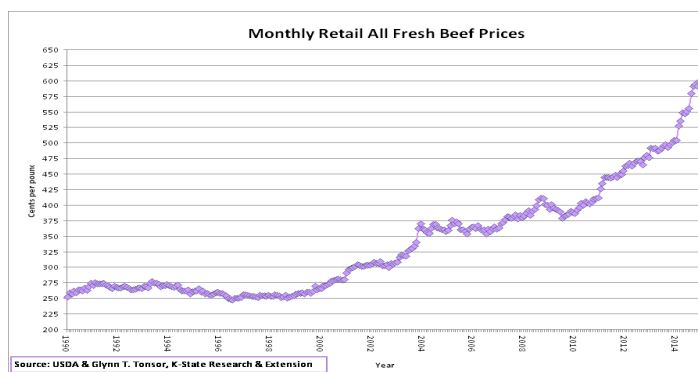


WHOA NELLY - WHAT'S UP WITH THE COST OF BEEF? A LAYMAN'S PERSPECTIVE

Jon Meadus PhD

Agriculture and Agri-Food Canada, 6000 C&E Trail, Lacombe, Alberta, Canada, T4L 1W1

North American ground beef prices have remained steady from 1976 to 2000 at ~ \$5.75/kg to \$6.60/kg but in the last 4 years it has increased over 50% to > \$11.90/kg in 2015 (Stats Canada Index) Meanwhile US beef demand has been declining. Since 1976 demand per capita is down 33%, from ~90 lbs/capita in 1976 to ~60 lbs/capita in 2015.

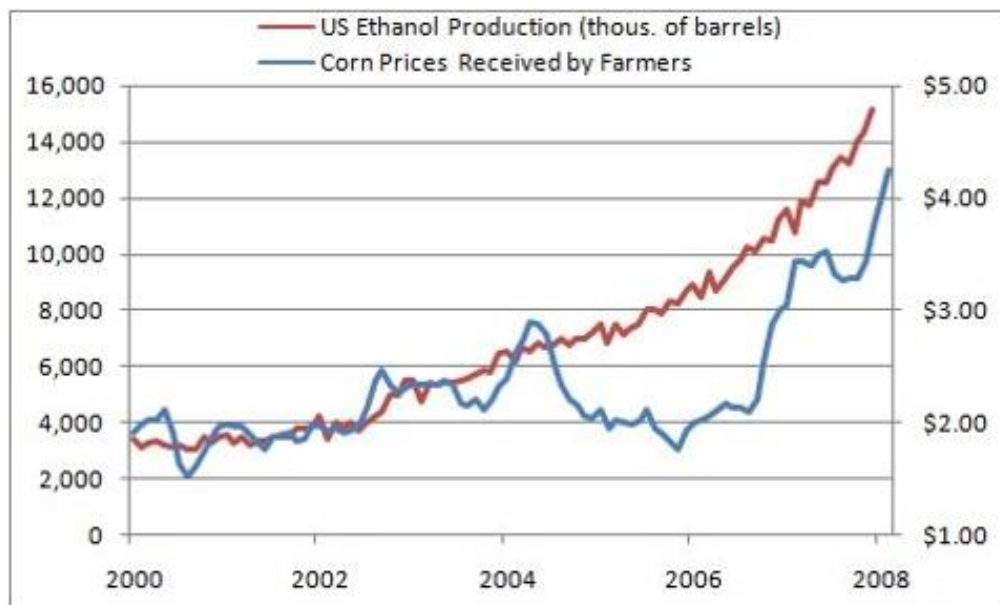


What causes these changes in beef demand and how does it affect price?

According to a study by Dr John Cranfield in 2012 at the University of Guelph, beef demand is increasingly becoming *inelastic*. A 1% increase (or decrease) in the price would result in a 0.428% decrease (or decrease) in demand or consumption. The demand for chicken at 0.49% and pork at 0.502% are even more inelastic. Even though, the prices of these two meat sources are still considerably lower than beef, consumers are even less willing to pay for any increase. Price is determined by countless factors that influence a consumers willingness to buy and it can change on a whim such as food safety issues (ie) BSE, E. coli, mystery meat or even a price ceiling, the cost of going from 3.99/lb to 4.00/lb (Kevin Grier Market Analysis Consulting Inc.)

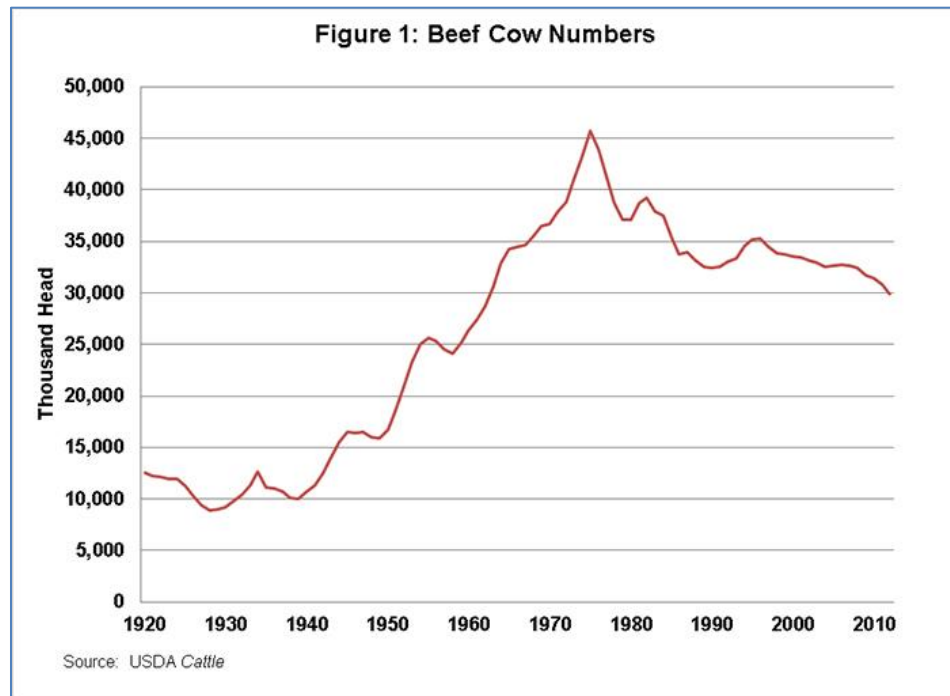
Who is making a profit at the high prices or are they just a reflection of dwindling supply?

The current cost of beef is going to drive down demand even further. The profit in the beef chain seems to favour the processors but many of the big slaughter houses are closing due to short supply. Producers, and especially, cow calf producers, have existed in a nearly perfectly competitive industry; where the calf prices reflect the cost to fully raise a beef cow for the beef plant granting only a minor amount of profit on an animal



\$200/head (2004). The cow/calf price will factors in the feed, veterinary, yardage, and supplement cost. The biggest cost is feed and since the fall of 2013, there has been record high feed cost. We can blame it on the US trying to make a domestic ethanol market but more so on the recent drought in the mid US. Corn cost hit record highs in 2008, 2012 to 2013.

In 2013, US corn prices were high and the beef cattle numbers were reduced to a record low of 87.9 million head, producing about 24.32 billion pounds of meat. In 2014, the western US corn prices are still high but leveling off. In Canada, we have barley feed but it represents only a small fraction in the North American commodity feed market.



If the 2015 corn crop improve in yield and cost less, it will drop prices but *how long before we see any saving at the retail store ? Probably not anytime soon.*

Demand and supply of fresh beef and beef products from outside the US and North America help smooth out the price fluctuations but pressure from emerging economies that like beef such as Russia, China and India are going to help keep prices high.

EFFECTS OF PRODUCTION SYSTEM AND GROWTH PROMOTANTS ON THE PHYSIOLOGICAL MATURITY SCORES IN STEERS

Ó. López-Campos^{1,2,*}, J. L. Aalhus¹, N. Prieto^{1,3}, I. L. Larsen¹, M. Juárez¹, and J. A. Basarab⁴

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In the absence of verifiable chronological age, both dentition and carcass ossification have been used as physiological indicators. Physiological maturity is also important in the determination of meat quality. Changes in production practices may have altered the relationship between chronological age and physiological maturity. The objective of this study was to determine the impact of calf-fed vs. yearling-fed production systems with and without aggressive growth implant, on the physiological indicators of chronological age.

Two hundred and twenty-four crossbred steers were used to evaluate the impact of calf-fed (harvested at 11-14 mo of age) vs. yearling-fed (harvested at 19-23 mo of age) production systems with and without aggressive growth implant, on the physiological indicators of chronological age. There were significant interactions ($P < 0.001$) between the production system and the implanting strategies on the frequencies of the carcasses showing ossification in the sacral, lumbar and thoracic vertebral column portions. The results indicate physiological age of the carcasses might be dramatically impacted depending on the combination of the production system and growth implant strategy. However, when birth date documentation is not available, a compendium of descriptors (dentition and ossification processes at the vertebrae) should be taken into consideration in order to establish the eligibility of the carcass to meet certain age criteria.

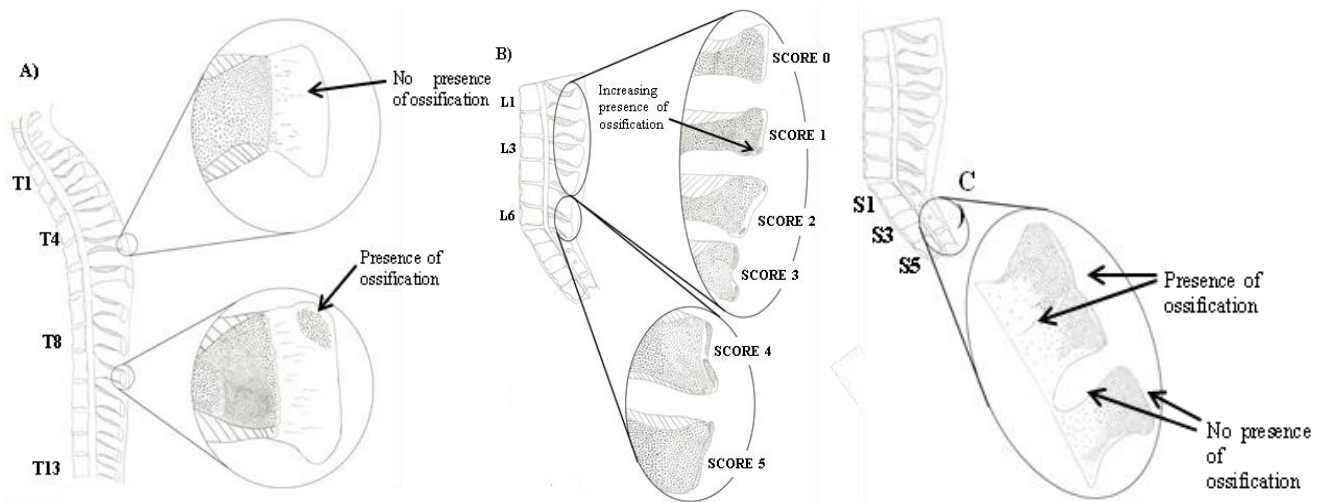


Figure: Overview of the criteria established in the Canadian beef age verification study (Robertson *et al.* 2006) for the thoracic (A), lumbar (B) and sacral regions (C) used in the present study.

Technical drawings by Mr. Christopher Villacorta-López

IMPACT ON THE ANIMAL PROTEIN INDUSTRIES OF THE NEW FAO REPORT ON PROTEIN QUALITY MEASUREMENT FOR HUMANS

Dr. Ron Ball, Professor Emeritus of Nutrition, University of Alberta

The FAO has released a report that should be of keen interest to everyone involved in the business of producing human proteins. This is important because it will change the status of animal proteins versus vegetable proteins.

"Research approaches and methods for evaluating the protein quality of human foods - Report of a FAO Expert Working Group." You may access to the report through this link <http://www.fao.org/3/a-i4325e.pdf>

Animal Proteins vs Plant Proteins

This report provides recommendations and methods necessary to move the evaluation of protein quality on a worldwide basis to the new method of DIAAS (digestible indispensable amino acid score). This new method will have considerable impact on the animal protein industry because the old method overestimated the protein quality of vegetable proteins. As a result it appeared the people were meeting their dietary requirement for protein and amino acids from vegetable proteins, when in actual fact they were not.

With the new method of DIAAS, animal proteins, including meat, meat products, and dairy, will rank much higher than plant proteins because animal proteins are both more digestible and have better amino acid scores than plant proteins. Under the new methods people will have to consume 10, 20 and even 30% more vegetable protein to meet their amino acid requirements. This change will place animal proteins at much greater advantage when global decision makers are seeking ways of improving food security and human nutritional status.

Recommendations for Increased Protein and Amino acid Requirements for Humans

The second component of this story is the fact that the most recent documents on human protein and amino acid requirement have significantly increased the recommended protein intakes compared to the previous documents. This is already having an effect on the recommendations for animal protein consumption in developed countries. This will have an additive effect on the increased demand for animal protein on a worldwide basis.

New Research is Necessary to Complete the Move to DIASS

The Report concluded with a number of recommendations including:

- "the complete value of DIAAS could not be realized until there are sufficient accumulated digestibility data for human foods as determined by competent national and/or international authorities"
- "there is the need to develop a fully accessible, robust database on amino acid digestibility of foods and diets from different regions of the world."
- there is the need to identify funds for research. The experts believed that public and private sector funding would be required to carry out this work and efforts should be made to encourage such funding.

The Way Forward

Protein quality is an important public health issue that has been under-recognized and under-valued for decades. We have an opportunity to correct this problem and benefit both public health and the industries we support, but it will require a considerable investment of dollars into the necessary research and into public education.

Dr. Ron Ball was a member of the Expert Working Group that produced the report on evaluating the protein quality of human foods. He developed the indicator amino acid oxidation method that was recognized in the Report as one of only 2 published bioassay methods that produce data on amino acid bioavailability in humans. This was the only method that was clearly endorsed by the Expert Working Group. He has published more than 200 research papers in the areas of protein and amino acid requirements, amino acid digestibility and protein quality in humans and animals.